1   We claim:

2   1.   A multicast failover device comprising:

3   a processor;

4   at least one primary receiver for receiving packets from at least one primary

5   multicast stream source;

6   at least one secondary receiver for receiving packets from at least one

7   secondary multicast stream source;

8   logic for multicasting packets received by the primary multicast stream source

9   over

10   an external network;

11   logic for detecting an adverse change in a packet from the primary multicast

12   stream; and

13   logic for multicasting a packet from the secondary multicast stream in lieu of

14   multicasting the packet from the primary multicast stream when the adverse

15   change in the packet of the primary multicast stream is detected.

16   2.   The multicast failover device of claim1 further comprising:

17   storage for a primary buffer for storing packets received from the primary

18   multicast stream source; and

19   storage for a secondary buffer for storing packets from the secondary

20   multicast stream source.

21   3.   The multicast failover device of claim 2 further comprises:

22   logic for multicasting packets from the primary buffer over an external

23   network;

1   logic for detecting an adverse change in a packet stored in the primary buffer;

2   and

3   logic for multicasting a packet from the secondary buffer over the external

4   network when the adverse change in the corresponding packet of the primary

5   buffer is detected.

6   4.   The multicast failover device of claim 3 wherein the processor further

7 comprises logic for synchronizing the packets in the primary buffer and the secondary

8 buffer.

9   5.   The multicast failover device of claim 4 wherein the logic for synchronizing

10 packets in the primary buffer and the secondary buffer comprises:

11   logic for identifying the source of the packet when the packet is from the

12   primary multicast stream source;

13   logic for identifying the source of the packet when the packet is from the

14   secondary multicast stream source;

15   logic for identifying a packet's sequential position from a multicast stream;

16   logic for inserting a primary multicast stream packet in the primary buffer at

17   an offset that maps to the packet's sequential position from the primary

18   multicast stream; and

19   logic for inserting a secondary stream multicast packet in the secondary buffer

20   at an offset that maps to the packet's sequential position from the secondary

21   multicast stream such that the packet in the primary buffer at a specific offset

22   is of the same packet's sequential position as is the packet at the

23   corresponding offset of the secondary buffer.

1   6.   The multicast failover device of claim 5 further comprises logic for

2   multicasting a packet from the secondary multicast buffer when an adverse change in

3   a packet in the primary multicast buffer is detected.

4   7.   The multicast failover device of claim 6 wherein the packets in the primary

5   buffer further comprises a first IP header associated with a primary multicast stream

6   server and wherein the packets in the secondary buffer comprises a second IP header

7   associated with a second multicast stream server; and wherein the processor further

8   comprises:

9   logic for rewriting the first IP header with a virtual multicast IP address

10   and port number when a packet from the primary buffer is multicast on the

11   external network; and

12   logic for rewriting the second IP header with a virtual multicast IP address

13   and port number when a packet from the secondary buffer is multicast on

14   the external network

15   8.   The multicast failover device of claim 7 wherein the processor further

16   comprises logic for multicasting the packet next in sequential position relative to the

17   last packet multicast by the failover device such that the packet stream multicast by

18   the failover device is continuous and the packet sequence position integrity is

19   maintained.

20   9.   A system for reliable multicasting of streaming data comprising:

21   primary stream packets having a first multicast IP address and port number;

22   secondary stream packets having a second multicast IP address and port

23   number;

1   an enterprise network on which the sources for primary stream packets and

2   secondary stream packets are connected;

3   a multicast failover device connected to the enterprise network comprises:

4   a receiver for receiving the primary multicast stream packets;

5   a receiver for receiving a secondary multicast stream of packets;

6   an external network for transmitting multicast stream packets to at least

7   one user;

8   logic for multicasting the primary multicast stream packets over the

9   external network;

10   logic for detecting an adverse change in a packet from the primary

11   multicast stream;

12   logic for multicasting a secondary multicast stream packet over the

13   external network in lieu of multicasting the primary multicast stream

14   packet when the adverse change in the primary multicast stream packet is

15   detected.

16   10.   The system of claim 9 further comprising:

17   storage for a primary buffer for storing the primary multicast stream packets;

18   and

19   storage for a secondary buffer for storing the secondary multicast stream

20   packets.

21   11.   The system of claim 10 further comprising:

22   logic for multicasting packets from the primary buffer over the external

23   network;

1   logic for detecting an adverse change in a packet stored in the primary buffer;

2   and

3   logic for multicasting a packet from the secondary buffer over the external

4   network when the adverse change in the corresponding packet of the primary

5   buffer is detected.

6   12.   The system of claim 11 further comprising logic for synchronizing the packets

7   in the primary buffer and the secondary buffer.

8   13.   The system of claim 12 wherein the logic for synchronizing packets in the

9   primary buffer and the secondary buffer comprises:

10   logic for identifying when a packet is from the primary stream;

11   logic for identifying when a packet is from the secondary stream;

12   logic for identifying a packet's sequential position from the primary stream;

13   logic for identifying a packet's sequential position from the secondary stream;

14   logic for inserting a primary stream packet in the primary buffer at an offset

15   that maps to the packet's sequential position from the primary stream; and

16   logic for inserting a secondary stream packet in the secondary buffer at an

17   offset that maps to the packet's sequential position from the secondary stream

18   such that a packet in the primary buffer at a specific offset is of the same

19   packet's sequential position as is the packet at the corresponding offset of the

20   secondary buffer.

21   14.   The system of claim 13 wherein the multicast failover device further comprises

22   logic for multicasting a packet from the secondary buffer when an adverse change in

23   a packet in the primary buffer is detected.

1   15.   The system of claim 14 further comprises:

2   logic for rewriting the IP address and port number of a packet of the primary

3   buffer with a virtual IP address and port number when a primary buffer packet

4   is multicast over the external network; and

5   logic for rewriting the IP address and port number of a packet of the

6   secondary buffer with the virtual IP address and port number when a

7   secondary buffer packet is multicast over the external network.

8   16.   The system of claim 15 further comprising logic for multicasting the packet

9   next in sequential position such that the packet stream multicast by the system is

10   continuous and the packet order integrity is maintained irrespective of the buffer

11   location that the packet had been stored such that the clients detect no outage,

12   discontinuity or quality loss.

13   17.   A method for reliably multicasting data comprising;

14   receiving over an enterprise network primary multicast stream packets from a

15   primary multicast stream server, said packets having a first multicast IP

16   address and port number;

17   receiving over an enterprise network secondary multicast stream packets from

18   a secondary multicast stream server, said packets having a second multicast IP

19   address and port number;

20   multicasting the primary multicast stream packets over an external network;

21   detecting an adverse change in a packet from the primary multicast stream;

22   multicasting a secondary multicast stream packet over the external network in

1   lieu of multicasting the primary multicast stream when the adverse change in

2   the packet of the primary multicast stream is detected.

3   18.   The method of claim 17 further comprising:

4   storing packets received from the primary multicast stream source; and

5   storing packets from the secondary multicast stream source.

6   19.   The method of claim 18 further comprising further comprises:

7   multicasting packets from the primary buffer over an external network;

8   detecting an adverse change in a packet stored in the primary buffer; and

9   multicasting a packet from the secondary buffer over the external network

10   when the adverse change in the corresponding packet of the primary buffer is

11   detected.

12   20.   The method of claim 19 further comprises synchronizing the packets in the

13   primary buffer and the secondary buffer.

14   21.   The method of claim 20 wherein the synchronizing packets in the primary

15   buffer and the secondary buffer comprises:

16   identifying the source of the packet when the packet is from the primary

17   multicast stream source;

18   identifying the source of the packet when the packet is from the secondary

19   multicast stream source;

20   identifying a packet's sequential position from a multicast stream;

21   inserting a primary multicast stream packet in the primary buffer at an offset

22   that maps to the packet's sequential position from the primary multicast

23   stream; and

1 inserting a secondary stream multicast packet in the secondary buffer at an

2 offset that maps to the packet's sequential position from the secondary

3 multicast stream such that the packet in the primary buffer at a specific offset

4 is of the same packet's sequential position as is the packet at the

5 corresponding offset of the secondary buffer.

6 22.   The method of claim 21 further comprises multicasting a packet from the

7 secondary multicast buffer when an adverse change in a packet in the primary

8 multicast buffer is detected.

9 23.   The method of claim 22 further comprises rewriting IP header information in

10 the packet being multicast on the external network with a virtual multicast IP address

11 and port number when the source of the packet is the primary buffer and when the

12 source of the packet is the secondary buffer.

13 24.   The method of claim 23 further comprises multicasting the packet next in

14 sequential position relative to the last packet multicast on the external network such

15 that the packet stream multicast is continuous and the packet sequence position

16 integrity is maintained.

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